Electricity on the Farm

MAGAZINE

FEBRUARY
1939

Left:
Mr. Bowman's farm is equipped with a complete wiring system

Above:
"Roomy" initial wiring eliminates exp rewiring on Mr. Bowman's farm

"I'M GLAD I HAD MY FARM WIRED THE RIGHT WAY"

says Mr. D. O. Bowman, R. D., Rockford, Michigan

"Several years ago, when I first got electricity on my farm, I nearly made a costly mistake. However, the Consumers Power Company told me how important good wiring was, and I paid a real contractor $225.00 to put in a good job, planned especially for my farm.

"When I see my neighbors worrying along with skimpy wiring systems—patching and rewiring—I thank my lucky stars for doing the job right. I can put new equipment in anywhere. It all operates 100% and pays me a better profit.

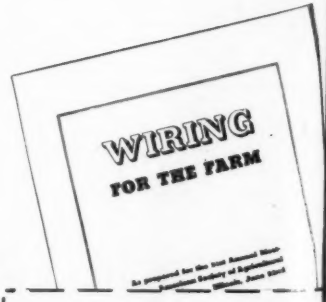
"My advice to any farmer is, 'Have a good contractor put in a wiring system that will serve you for years—do it right and you only have to do it once.'"

Do your lights flicker? Do your motors lack pep? Can you add appliances or power equipment to your system without changing your wiring?

In many cases inadequate wiring is the cause of such troubles. And 70 out of every 100 wired farms *are wired inadequately*.

A competent electrical contractor will be glad to help you check your wiring system. He will show you how to make it accommodate the many appliances and electric tools which will do much of the heavy work around the home and the farm. Make sure he uses G-E wiring materials throughout; they will give you long, dependable service.

Some interesting information on farm wiring is contained in the publication "Wiring for the Farm." You can obtain a free copy by addressing General Electric, Schenectady, N. Y.



General Electric Company
Dept. 6A3-201, Schenectady, N. Y.

Please send me a free copy of "Wir Farm," which contains information on how most out of electricity on the farm.

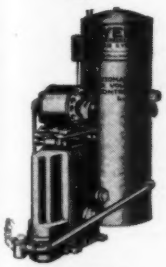
Name .....

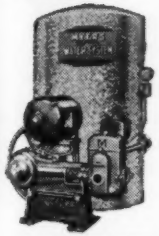
Address .....

.....

GENERAL ELECTRIC

RUNNING WATER
YOUR FAMILY DESERVES IT





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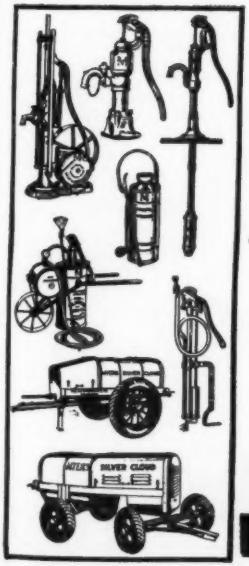

A MYERS system keeps the water flowing *whenever* and *wherever* you need it. Ample capacity for all needs . . . in kitchen, bathroom and laundry . . . at outside hose taps for sprinkling and fire protection . . . in barnyard, milkhouse and outbuildings. Quality built, fully proven . . . economical to operate. Deep and shallow well models to meet all needs; for operation by electricity, gasoline engine, windmill or hand power. Write for free booklet and name of dealer.

BEWARE OF A "SQUIRT GUN" WATER SYSTEM

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Editor's Chat

"A STITCH IN TIME"

Is the iron cord or the lamp cord kinked or frayed?

Have the pump and washing machine motors been oiled lately?

Is the fan cleaned and greased ready for next summer's heat?

Does the sickle need grinding or some sections or ledger plates need replacing? Your tool grinder—how's the stone? Need dressing or a new one?

Thermostat points on brooders and hot beds get rough and burned. A file helps them.

How about parts for the plow, the binder, the irrigation pump? It takes time. Summer's coming.

Would an extra outlet or two in the barn save you time doing chores, enable you to use your cow clipper easier, give you a chance to use an electric heater at lambing time or on the sick cow or calf?

Motors should have a periodical inspection. Clean them. Suck the dirt out of windings with a vacuum cleaner. Put clean oil in the oil wells. Are the brushes worn short?

Loose bolts, broken parts, poor single- and double-trees, broken furniture, harness repairs,—use your electric drill, tool grinder, soldering iron, lathe, band saw.

For better plants, there's electric hotbeds; for higher priced milk,—electric coolers; for torn overalls—the electric sewing machine; for better living, —, —, —.

"A Stitch in Time Saves Nine!"

—*I'm proud I am a farmer*—

GRASS SILAGE

One way to lessen the cost of equipment—your silo, ensilage cutter and motor, for instance—is to make more use of it. Equipment continues to cost in the form of interest and depreciation whether we use it or not.

I have been thinking of grass silage. You no doubt have been, too. No feed product has sprung into the minds of farmers faster than grass silage. There are good reasons. Grasses and legumes are grown in all sections of the country. Cut at the proper stage of growth, they contain large quantities of digestible nutrients and are rich in proteins. If we wait until they are more mature, we get more fiber and less protein.

Grasses are to be cut in the spring. Rain is not likely to injure them for silage as for hay. In the silo, they make excellent summer feed when pastures may be dry. They extend the use of silos and cutters. With cheap molasses or phosphoric acid for preservatives and to fortify the feeding value, they threaten corn as the most valuable silage crop.

Grass silage calls for different handling than cured hay or green corn. A molasses pump on the cutter helps. More power is needed to cut and elevate grass than corn.

This, too, is a "stitch" reminder.

George Kable

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Call on your Singer Shop for a demonstration of these two wonder-workers. Or write to the Singer Sewing Machine Company for information, and the address of your nearest Singer Shop.

SINGER SEWING MACHINE COMPANY
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Chester Pilch sexes day-old chicks at a rate of 120 per hour with accuracy of 97 per cent. He has good light to aid his skill and knowledge.

SEX APPEAL of CHICKENS STARTS CAREER FOR 4-H CLUB BOY

Chester Pilch Tells His Story of Success with Poultry in an Electrically Equipped Plant, and His Side Line of Sexing Day-Old Chicks

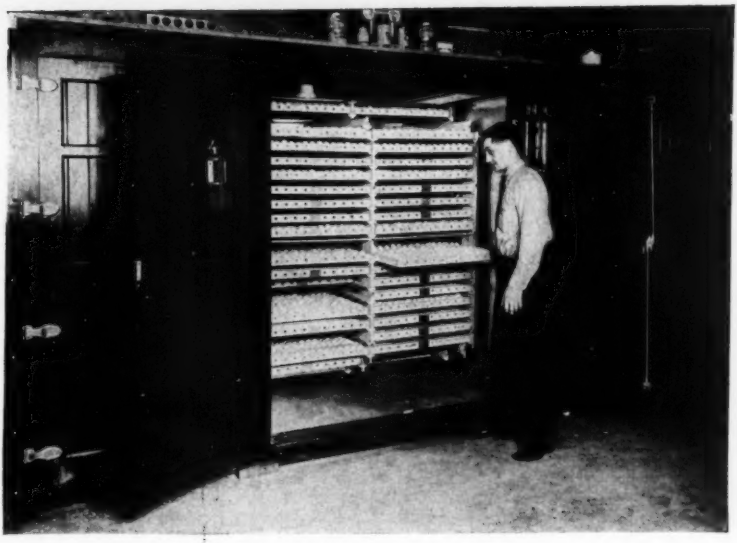
By CHESTER PILCH

Chester Pilch is 26 years old. He operates a poultry farm at Hazardville, Connecticut. After graduating from high school in 1931, Chester trod from one business establishment to another looking for a job, but without success. Discouraged with the employment situation he made a careful study of the economies of poultry raising. It was the step that started him toward success.

At a 4-H Club meeting in the fall of 1933 Chester heard of a new course being offered by Prof. Gibbs at Massachusetts State College in the Chinese method of sexing day-old chicks. The art of sexing involves a microscopic anatomical examination which requires much practice and skill before speed and accuracy can be attained. Chester recognized the appeal that "all male" or "all female" chicks would make to broiler raisers and commercial egg producers. Believing the chick sexing occupation of economic value, he hitchhiked once a week to the College for instruction. After three years of patience and practice, Chester developed a high degree of speed and accuracy. With an accuracy as high as 97 per cent, he has sexed 12,000 chicks in one day at one cent per chick, or $120 for the day's work. This side line in his poultry practice has made him a reputation as New England's outstanding chick specialist and brings him numerous requests from large poultrymen for sexing chicks.

This story of Chester Pilch is another example of finding "acres of diamonds" in your own backyard—this time with a vision and expertness developed through the stimulus of the 4-H Club.—Robert L. Zahour, Conn. Light & Power Co.

I OWE much of my knowledge in the poultry industry and in my side line specialty—the sexing of day-old chicks—to the guidance and training from the 4-H Club, in which I still take active interest. This preliminary training helped me in planning the foundation for this business and in making the selection of 500 Rhode Island Reds which in 1932 started my career. In the depressing times of that year I faced the problem of economic changes in the poultry industry. Increasing feed costs and lower egg prices reduced the possible margin of profit so that efficient poultry farm management was extremely important. My plan of operation consisted of hybridizing (on the heterosis plan), sexing day-old chicks, and modernizing the poultry plant with electrical equipment to minimize operating costs. This plan has proved itself in widening the profit margin especially during depressing times.



One of the 32,000 egg electric incubators which are operated twelve months of the year at the Pilch poultry plant.

My 4-H Club, convinced of the sound, economic principles of my poultry project, recognized my venture and made it possible for me to obtain loans from banks prepared to extend credit to approved 4-H Club members.

On my 110-acre farm, I have two 32,000 egg modern electrically operated incubators which consistently produce a uniform hatch of high percentage. It costs me about 5 cents per hundred chicks for electric power to operate these incubators. This low cost way of incubating gives me a greater margin of profit than I could realize from any other method. My brother Francis supervises the routine of the poultry plant while I attend to the special phases, new developments, and commercial details of the business.

I am fortunate in having my father, who is a good carpenter, mason and mechanic, to help me build chicken coops and brooder sheds, from building materials I obtain, inexpensively by shopping around where barns or buildings are being torn down.

In the brooder sheds, I house ten 1,000 chick battery brooders, each electrically heated with five 110-watt elements which operate through carefully adjusted thermostats to keep the temperature uniform. The automatic features of electric brooding keep temperatures more accurate and uniform, require less personal attention, and make it more economical than any other method. My average cost for electric brooding is less than one cent per chick per year.

I have learned from actual experience that the use of electric lights in my hen houses is an excellent way to maintain uniform egg production during the shorter days of the fall and winter seasons, and also to control molt periods of early hatched pullets and breeding hens. For uniform egg production during the shorter days, I burn the lights early in the morning so as give the layers a full 13-hour day. When egg prices are running high, I forestall a seasonal molt period by burning the lights all night. When I'm ready to have the hens molt, the lights are discontinued and the molting period takes place immediately and in much less time than ordinarily. The intelligent use of electric lights enables me to have fertile eggs and to start chicks every month of the year,

Francis Pilch with one of the 10 electrically heated battery brooders of 1,000 chick capacity.

Slumps in egg production due to cold or frozen drinking water are prevented with automatic electric water warmers.

thus keeping my 4,000 hen plant at full capacity to obtain highest efficiency.

During the cold winter days, I put automatic electric water warmers in the drinking fountains of the hen houses, to keep the water from freezing or getting too cold. This, I find, is very important, as it affects egg production very seriously to have drinking water ice cold or frozen. You see, a laying hen normally drinks a half pint of water a day to help form her eggs, which are 75 per cent water. If the water is frozen, the hens will not eat, and therefore cannot produce. And if the water is ice cold, the hens will drink only a small quantity. It costs less than one egg a day to operate an electric water warmer, and yet this simple way, which requires no attention because of its automatic feature, prevents costly slumps in egg production during cold snaps.

Small electric motors pump fresh spring water from my wells for both the poultry plant and household needs. An electrically operated spray gun has paid for itself time and again in reducing the cost of painting the barns and sheds with aluminum paint and spraying disinfectants in coops and brooder houses.

In our house we enjoy the time and labor saving features that electricity offers to make living more comfortable. We always have plenty of hot water on tap from our electric hot water heater. Our radio, electrical appliances, lights and refrigerator all make living modern and comfortable for us. And yet, with all these electrical devices on the poultry farm and in the house, our electric bill amounts to only $1.50 a day for everything. When I compare this bill with the cost of doing many of these chores without electricity, I sometimes wonder how anyone can make any money out of this business and be without electric service.

often proud I am a farmer—

LAMP HEATED BROODERS GIVE PIGS GOOD START

FARROWING time in cold weather is a harrowing time for little pigs. The little fellows get under the straw, try to get up close to the mother sow or between the sow and the wall and are too often smothered or crushed. A number of farmers in different sections of the country have found a rather simple way to prevent this loss and give the pigs a better start toward pork.

A protecting hover is built across the corner of the farrowing pen as shown in the illustration. The corner should be boarded tight so there will be no drafts. The top of the hover should be 15 to 18 inches off the floor. It may be built into the corner or made as a unit to be lifted out when the pigs get large enough to take care of themselves. This corner protection will permit the pigs to get in where

CX lamp for young pigs on Kolinski farm in Wisconsin. Guard rail of iron pipe set in concrete floor.

Have the top of the hover 15 to 18 inches above the floor so the heat will spread out and not be too close to the pigs. Nail a board across the front of the hover just high enough to admit the pigs and keep the sow out. A guard strip should also be placed above the brooder to keep the pigs and sow away from the wiring and reflector.

they can dry off or get warm and at the same time be out of danger of being crushed.

A satisfactory heating element for such a pig brooder is an ordinary 150 watt Mazda lamp in an RLM, porcelain lined reflector. A hole should be cut in the top of the brooder just slightly smaller than the diameter of the reflector. The reflector may be held in place over the hole by driving several nails around it. A guard strip should then be placed above the brooder across the front to prevent the stock from interfering with the lamp and wiring. The whole brooder may then be covered over with sacks. Care should be used to have the wiring well insulated. Rubber covered cord is best.

The grower who wants to do a really good job in starting his pigs should use a 250 watt CX Mazda lamp in his brooder. These lamps, in addition to providing heat, produce ultra-violet irradiation. Ultra-violet has a stimulating and beneficial effect on most animals, particularly during cold or cloudy weather when they do not have access to direct sunlight. It helps to ward off colds, aids in calcium assimilation and gives the pigs a better start. These lamps cost more than regular Mazdas but may be used on the regular 110-120 volt lighting circuit. Get them from your power company, electrical dealer or department store. It is essential to use aluminum reflectors with CX lamps as porcelain or white enamel does not reflect ultra-violet effectively. It is also quite essential that the voltage be up to that for which the lamp was designed, as CX lamps produce little ultra-violet when the voltage is low.

Another method of using the CX lamp is shown in the picture taken on the M. C. Kolinski farm near Waterford, Wisconsin. The guard rail made of pipe set in the concrete floor is far enough from the wall to give protection to the young pigs. Mrs. Kolinski said they did not lose a pig.

Pennsylvania F. F. A. Demonstrate Pig Brooder Construction

A year ago three boys Louis Kenamond, Richard Baker and John Crosbie, representatives of the Trinity (Pa.) High School Chapter of the Future Farmers of America won the award for the best demonstration at the Pennsylvania Farm Show by building and describing a pig brooder before their audience. The declared purpose of the demonstration was "to show how more pigs can be raised to weaning age by the use of an electric pig brooder." A 250 watt CX lamp was used as a heater.

Each boy spoke. One said: "Where a pig brooder is used, the mother has become only a filling station for the pigs. They sleep and play beneath the protection of the brooder where light and heat keeps them warm, dry and safe from the awkward mother. By placing a small trough beneath the brooder, supplementary feed can be fed very easily."

The brooder cost $7.20 including lumber. The current cost for 21 days was $3.78.

The boys did such a good job, and the story was so convincing that they have been called upon to repeat the demonstration in different locations.

Screw Cutting Lathe as a Farm Tool

Farm Mechanics Shop, Brazil, Indiana. The boys are studying vocational agriculture which includes the application of the screw-cutting lathe in the maintenance of farm equipment. The shop is under the supervision of Adam Bowles, Instructor.

Most farm machinery is made of steel. As farms become better equipped, the lathe might well supplement the forge. They are made in all sizes, from those for use on a bench to machines for turning ship shafts. In addition to being useful for making replacement parts for machines, cutting threads, truing commutators, etc., it is a fascinating job to run a lathe for the man or boy who is mechanically inclined.

WE ARE HAPPY ABOUT THE WHOLE THING

Demonstration Farms in Northern Illinois Really Demonstrative. Costs, Savings, Conveniences, and Greater Pleasure from Living All Prove Electricity a Good Investment

By RUTH BEARD

SIX months ago if someone had suggested to my father that he get more electric appliances and double his use of electricity on our farm he would have said "No" in no uncertain terms. Yet, oddly enough, in the last six months we have more than doubled our use of electricity by adding modern lighting, electric range and water heater, a dairy water heater, electric mangle, roaster and several small appliances. Today if anyone should suggest to father that he give up these new appliances and go back to the old way of doing things he would say "No" even more emphatically, ably seconded by my mother, my brother and myself.

It all came about this way. The Public Service Company which supplies us with electric service was anxious to make an experiment in electrified farming to demonstrate to ourselves and our neighbors the exact cost and benefits of modern electric appliances for the farm and the home. Arrangements were made with my father to try several additional appliances each equipped with an electric meter showing its exact cost of operation. At the same time similar arrangements were made at two other farms in this vicinity: the Stilling Farm and the Russell Farm.

Were these experiments worth while? Did they prove anything? If you want the answer in dollars and cents refer to the accompanying table of results. These results are tabulated in kilowatt hours. To find what costs would be for you, multiply the kilowatt hours by your average electric rate.

But cost figures tell only a small part of the story. What these new electric conveniences have done for us is hard to put in words. And what may result for the hundreds of our neighbors who have visited the Stilling farm, the Russell farm and our farm during the trial demonstrations of electrified farming is impossible to calculate.

Thirty-two years ago father and mother came to this spot in northern Illinois to make a living from dairy farming. These were the days of kerosene lamps, dirt roads and bent backs, when everything had to be done by hand. Now all this has been changed very strikingly.

There's no more hauling of corn cobs and chopping of wood to feed the greedy kitchen range, no more pumping and hauling water, no more heating water in a kettle, no more aching hands and tired backs from hours of milking.

Kitchen a Work-Saver

Our kitchen now is a marvel of time and work saving convenience. An electric refrigerator keeps food fresh and appetizing. We no longer depend on the cellar which never was adequate. As soon as milk was kept in the refrigerator our family's milk consumption went up rapidly. An electric range and an electric water heater takes the place of the old wood range and boiler. And, of course, there is running water, electrically pumped, in the kitchen and also in the barns.

During thrashing time this year we gave our electric range a gruelling test and it passed with flying colors. Food was prepared for 29 hungry people. We simply put the food in the range oven,

Modern shaded fixture gives good illumination in the dining room.

set the controls and left it. When meal time came, it was deliciously done, without hours of fire tending and oven peeking.

Although we have had electric service on our farm for the last five years, we never realized how much it could do for us until the new appliances and lighting were added for the experiment. Our lighting now is as much better than it was before as the original electric lights were better than kerosene lamps.

Probably like many other farm people, we gather around our dining room table for studying, reading and sewing. Now we have a dining room fixture incorporating the new I.E.S. indirect lighting principle. This gives us plenty of soft, glareless light that's easy on the eyes and prevents fatigue and eyestrain. The living room is also well lighted with I.E.S. floor lamps, making it ever so much more attractive for entertaining company or our own use.

Another feature of our new household equipment is an electric mangle. Ironing is so much easier and takes up so much less time. We find that we can do shirts and fussy things as well as flat pieces. Often we have all our laundry completely finished by noon.

Milking Time Cut in Half

In operating the farm, exclusive of the home, we have again found our electric equipment of great value. Milking time has been cut in half by electric milkers. Two men using four units can now milk our forty cows in about an hour where formerly two hours were required. Running water electrically pumped of course means improved sanitation and healthier animals. An electric water heater keeps dairy utensils sterilized.

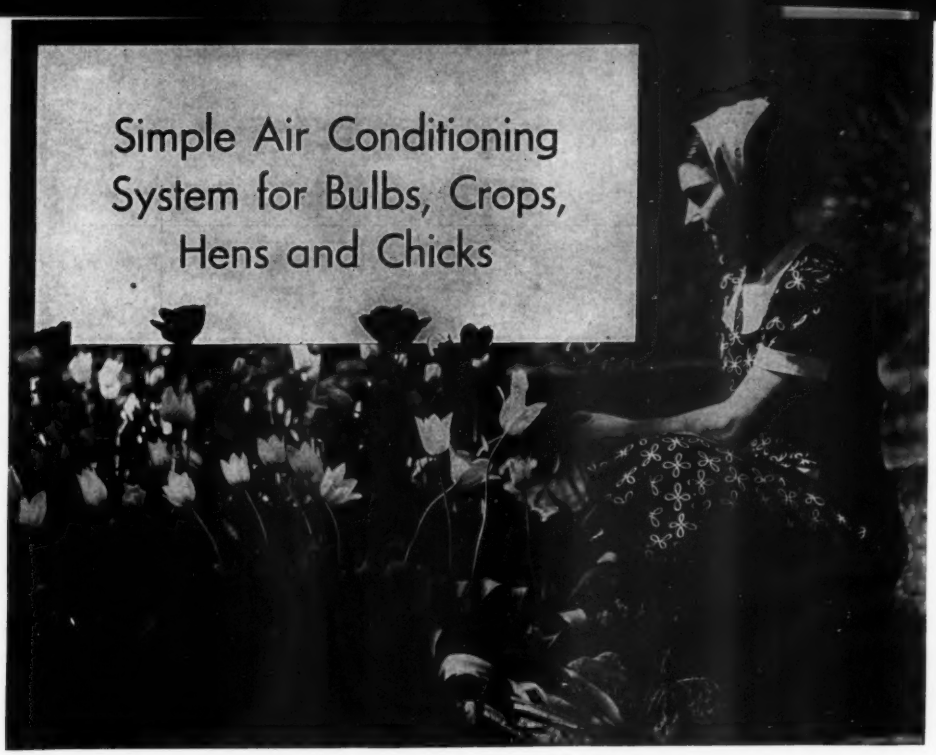
While it's impossible to attach a dollars' and cents' value to all of the many advantages electricity has brought to our farm, we are convinced our electric service and equipment are very worthwhile investments. Perhaps you'll get some indication of how I feel about it when I say that I have made up my mind not to keep house without an electric range, water heater and refrigerator. Probably only father and mother can really appreciate how much farm life has been improved in recent years, but all of us know that "we are happy about the whole thing."

Current Consumption of Various Appliances on the Electrified Farms

Equipment	Beard Farm*				Stilling Farm				Russell Farm			
	Acres in Farm—247 No. of People—7 Livestock—Dairy Cows—50 Milk per day—13 cans 390 cans per month Hogs—40 Horses—6 Chickens—100				Acres in Farm—133 No. of People—5 Livestock—Dairy Cows—25 Milk per day—9 cans 270 cans per month Hogs— Horses—4 Chickens—				Acres in Farm—151 No. of People—6 Livestock—Dairy Cows—30 Milk per day—12 cans 360 cans per month Hogs—40 Horses—4 Chickens—200			
	Kilowatt-hours Used				Kilowatt-hours Used				Kilowatt-hours Used			
	June	July	August	Sept.	June	July	August	Sept.	June	July	August	Sept.
House Water Heater.	256	222	252	244	220	234	198	202	304	302	274	256
Lights and Small Appliances	54	82	105	95	60	74	60	58	73	99	128	122
Water Pumping	43	42	44	31	3	3	3	2	35	47	40	34
Refrigerator	24	30	31	20	22	34	35	21	29	33	32	23
Dairy Water Heater	46	44	46	40	46	48	36	42	33	35	27	28
Milk Cooler	371	433	441	396	174	168	262	115	296	285	344	205
Range	96	128	129	104	89	105	116	150	114	145	166	136
Milking Machine	29	52	47	36	Included with Lights				54	53	51	40
Mangle	11	5	Not metered		Not metered				4	3	0	4
Roaster			17	24								
TOTALS	930	1038	1112	990	614	666	710	590	942	1002	1062	848

*Additional electric equipment used on the Beard farm includes: IES lamps, toaster, mixer, washer, sewing machine, shaver, brooder.

Simple Air Conditioning System for Bulbs, Crops, Hens and Chicks



Western Farmers Find Electric Ventilation Heating and Cooling Effective for Curing Tulip Bulbs and for Heating and Conditioning Hen and Chick Batteries

By J. C. SCOTT

WHILE there may be comparatively few farmers who are interested in drying tulip bulbs, the system may suggest a procedure to other farmers who want to improve present methods of drying other crops as onions and sweet potatoes.

At any rate, Mr. John Colyn, manager of a 160-acre tulip bulb farm known as the Van Zonneveld of Washington, Inc., near Orting, Washington, is more than pleased with the new way in which electricity has helped him to prevent thousands of bulbs he raised from becoming culls.

Two years ago Mr. Colyn made the following remark to the agricultural engineers of the power company: "As you know, the usual method of drying tulip bulbs is to store them in any old barn or building. However, these storage buildings have too much air circulation in the daytime and too much moisture at night. This causes the outer layer of the skin of the bulb to crack. This in turn results in the exposure of the next skin on the bulb. When this skin is exposed to the air, mold is formed on about 15% to 20% of the bulbs, resulting, of course, in their being culls.

"Now what I would like to do," Mr. Colyn continued is to put these bulbs into drying rooms arranged so that I can hold the temperature of the rooms at 80 degrees for 12 days.

"The temperature must be 80 degrees in all parts of the room, including all corners, the middle and what is much more difficult at both the ceiling and the floor in all parts of the room.

"Furthermore, I want to control the air movements so that there will be a gentle circulation to extend to each bulb in the warehouse without drafts. The bulbs, of course, will be put in thin layers on trays placed on top of one another, extending from the floor to the ceiling of the warehouse with provision for air circulation between trays or layers of bulbs.

"After the period of twelve days, when the bulbs are held at 80 degrees, they will be taken out and cleaned, then put back in the same room where they will be kept until planting time—a period of about four months—at the same even temperature, but this time at about 65 degrees."

This was a difficult assignment but the agricultural engineers have been able to do the job to Mr. Colyn's entire satisfaction. And here is what Mr. Colyn has to say about the new electric method of bulb drying after two years' experience and after growing a crop of the bulbs which had been dried alongside those which had been dried by old regular methods.

"It did a perfect job of curing the bulbs in a way that there were no cracks and no mold. Fur-

thermore, there was no disease in the plants from these bulbs during the spring of 1938. It is our custom to plant these cured bulbs in the fall, and the following spring they generally come up too early for their own good, after being cured by old methods. This early development of tulip bulbs seems to result in the botritus disease, commonly known as fire blight. Many fields of bulbs not dried by this new method were seriously damaged during the past year.

Bulb Development Under Control

"But the thing that I am pleased about is that the bulbs dried by the new electric method, through the control of temperature, could be retarded in their development for one month in the spring. That is just what bulb growers want. The retarded plants were not affected by the disease, and they made a much better growth and development after they did start to grow."

The control of the low temperature during the summer is usually accomplished by refrigerated cold storage, with the proper system of air circulation where summer temperatures demand. However, Mr. Colyn was able to keep the temperature in his warehouse down to the desired point by simply using his air circulation system during the night time to introduce cool air into the warehouse. Incidentally, the warehouse which Mr. Colyn used is a well-insulated building, sawdust and shavings being used as insulation.

And here is what the agricultural engineers developed in the way of a method to accomplish a new system of ventilating and controlling the temperature in the warehuose.

A multi-blade blower type fan driven by a ¾ h.p. electric motor was placed above the ceiling of the room. The 15-inch blower, turning 680 r.p.m., delivers 3,320 cu. ft. of air per minute, amounting to 17 air changes per hour.

The blower is set on a square distributing chamber over the ceiling of the storage room. From this distributing chamber four 10-inch round air ducts 8 feet long are extended to four holes in the ceiling. In each of these ducts are placed two 2½ k.w. electric heaters which are regulated by a thermostat in the warehouse room.

The four air ducts distribute air in the room at the ceiling against an 18-inch round baffle. These baffles are extremely necessary and should be set not more than 6 inches from the ceiling. These baffles direct the air out along the ceiling and to the walls, thus breaking down the force of the air current before it is gently diffused among the bulbs.

At each corner of the room, just above the floor, and in the walls, were placed 12-inch outlets with dampers. The dampers were used to regulate air pressure.

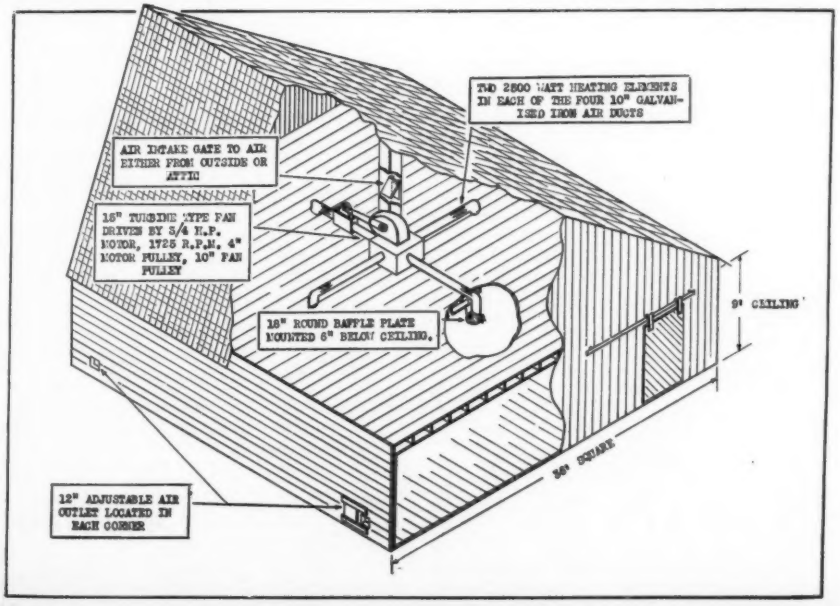
The success of this arrangement depends upon developing a slight air pressure within the room. As long as the air pressure in the room is a little greater than that outdoors we get complete and even circulation of air, and consequently even distribution of temperature to all parts of the room. A static pressure up to ½-inch water pressure was used in this building. The outlets at the floor and in the walls are very seldom left entirely open.

Current consumption on the above installations from June 1 to October 15 was 41,600 kilowatt hours for operating both motor and heaters, which, in Mr. Colyn's opinion, cost much less than the same heating job could have been done for by any other method on account of its automatic features and the elimination of manual labor or attention.

Similar System for Hens and Chicks

In the fall of 1936 an installation similar to this was made in a hen battery room on the farm of S. A. Sween, near Woodinville, Wash. Mr. Sween has for years kept all of his layers in individual cages and he had a problem in heating and ven-

(*More on page* 15)


TWO 2500 WATT HEATING ELEMENTS IN EACH OF THE FOUR 10" GALVANIZED IRON AIR DUCTS
AIR INTAKE GATE TO AIR EITHER FROM OUTSIDE OR ATTIC
15" TURBINE TYPE FAN DRIVEN BY 3/4 H.P. MOTOR, 1725 R.P.M., 4" MOTOR PULLEY, 10" FAN PULLEY
18" ROUND BAFFLE PLATE MOUNTED 6" BELOW CEILING.
9' CEILING
12" ADJUSTABLE AIR OUTLET LOCATED IN EACH CORNER

Bulb drying installation, Agricultural Engineering Department, Puget Sound Power & Light Co.

"BRASS TACKS" on ELECTRIC HOTBEDS

By GEO. W. KABLE

THIS is the time to be getting materials together for electric hotbeds for spring plants. You will need lead covered soil heating cable, a thermostat, switch, a good tight hotbed frame, fertile soil and some common sense.

The common sense comes first. Use it in selecting a location for the beds which will (1) not be too far from an electric circuit which can stand the extra load without dropping the voltage below 110 volts (correct voltage is important in electric heating); (2) give a good exposure to the sun—south slope is good; (3) be protected from winds by buildings, board fences, hedges or a special windbreak; (4) have good drainage; (5) be accessible to water. Order your heating cable and thermostats early enough so you will have them when you need them. If you do not know where to get them, ask your power company rural service man.

Soil heating cable is usually sold in lengths of 60 ft. The reason is threefold. Sixty feet gives the proper cable spacing when zig-zagged over a 6 x 6 ft. (2 sash) bed. It produces the right amount of heat for that size bed. In this length the cable does not get hot enough to injure growing plants. Longer lengths use less electricity and produce less heat. For instance, on a 115 volt circuit with No. 19 nichrome wire:

60	ft.	of	cable	uses	440 watts
70	"	"	"	"	378 "
80	"	"	"	"	330 "

The importance of voltage should be known. Here is the amount of heat in watts which will be produced by a 60 ft. cable at different voltages.

At	115	volts—	440 watts
"	110	" —	400 "
"	100	" —	333 "

If your voltage is low, you will not get the heat needed.

For beds longer than 6 ft., each 60 ft. length of cable should be connected across the 115 volt line just as you would plug in an additional electric iron or toaster. In large installations where 230 volt circuits are used, the cable should be cut in lengths of 120 ft. instead of 60 ft. On 220 volt circuits, 120 ft. of cable will use 880 watts which is correct for a bed 6 x 12 ft.

Several different methods of building electric hotbeds, or using soil heating cable in hotbeds, have been proposed. They all work, but some are better or cheaper than others. Refinements in construction are responsible for (1) saving electricity; (2) providing more uniform temperatures; (3) avoiding freezing on excessively cold nights; and (4) improved drainage, plant growth, etc.

One fundamental truth about hotbeds should be kept ever in mind. *The SUN furnishes a large part of the heat for plant growth.* Hotbeds should be constructed to take advantage of the sun's heat in the daytime and preserve as much as possible of it at night. During very warm days, the bed should be ventilated to relieve the excess heat. If the bed is well constructed, electric heat will be used mainly at night and on cloudy or very cold days.

The heating cable may be placed on the ground surface or 4 or 6 inches beneath the surface. In tests at several experiment stations the surface cable used somewhat less electricity to maintain the same temperature. Plant growth was equal or better and the surface cable gave more uniform bed temperatures and better protection from sudden drops in outside air. Do not use cable on the surface of sweet potato beds. It interferes with the growth of sprouts. Place the cable about 2 inches below the potatoes.

If the heating cable is to be buried, the top soil should first be removed, the bed leveled and the cable laid. Good fertile top soil is then put back over the cable. Some engineers recommend 6 inches of cinders under the cable for heat insulation and drainage. Place soil between the cinders and cable as some cinders cause rapid deterioration of the lead cable. Wire cloth or chicken wire about 1 inch above the cable will protect it some from being dug into.

For surface heating, prepare the bed ready for planting. Level it carefully. Lay the cable. Press the wire into the soil surface with a 1 in. x 10 in. x 5½ ft. board which may be used to stand on for planting. Plant in rows as if the cables were not there. Growth may be slightly uneven for a week but will level out.

The thermostat may be mounted on a side board of the bed. It should be connected electrically at one end of the cable and the bulb on the end of the

Sixty feet of cable in a 6 x 6 ft. surface heated experimental bed. Note the plants growing adjacent to cables in foreground. The instrument behind the man's hand is a recording thermometer, and has nothing to do with the heating installation. Windbreak on windward side.

copper tube placed in the surface soil between strands of cable. Adjust the thermostat before installing. Check it in a pail of water of the temperature you wish it to hold. Set it so the circuit will *close* at this temperature.

Following are some results of experimental work done by the author at the University of Maryland several years ago.

Ground surface—Ground in bed should be level for surface heating. If not level, ground will be warmer at high point and uneven growth will result.

Surface cables saved as much as 25% of power over that used in a bed with cable 6 inches deep. Bed temperature was 3° to 8° higher on cold nights. Seeds germinated quicker, plants grew faster and had better root systems. There was no injury to plants when in contact with the cable.

Cinder insulation—8 inches of cinders under the bed saved 19% in power where cable was 6 inches deep. Bed required more frequent watering. Saves little where the cable is on the soil surface.

Double glazed sash reduced power consumption 20% or more over single glazing.

Weather stripping to make sash fit tight saved 8½% of power.

Straw mattresses over single glazed sash saved 24 to 42% on power on 13° to 30° nights.

A good windbreak did much to cut down heat losses.

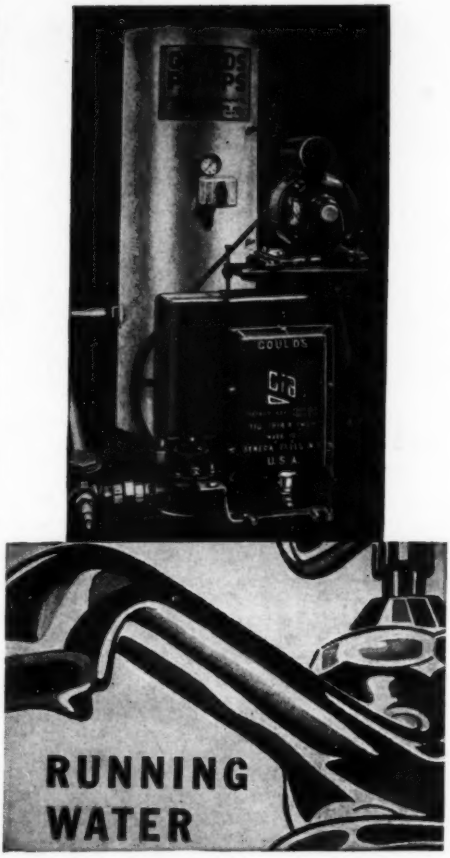
Simple Air Conditioning

(*Here from page* 13)

tilating these battery rooms. The installation was similar to that described for the bulbs except that there was only one ceiling opening into the room and a smaller blower was used with a ½ h.p. motor. The baffle pan under the blower opening was 1⅛ inch from the ceiling to deflect the air current against the ceiling. The blower furnished 1,100 cu. ft. of air per minute, suitable for 550 hens in a room 24′ x 40′. It used a 2.5 kw. heating element. The temperature was maintained at 50° with a variation of only 3° in the room. The hens furnished most of the heat from their bodies. This unit was operated in a 24′ x 30′ house containing 216 hens during December and January. The temperature was below freezing on 49 days and part of the time down to zero. Power consumption averaged 12 kw-hrs. per day.

The same equipment was later installed in a room 10′ x 9′7″ with 6′8″ ceiling used for battery brooding of baby chicks. The room was double-walled and insulated with shavings and provided with 6″ square openings in the wall near each of the lower corners. These were adjusted to build up a little back pressure for even temperature distribution and to provide about 25 changes of air per hour. With only 2,000 chicks in the room, which was large enough for 3,000, the temperature was maintained at 90° for 23 days starting February 24 with an average power consumption of 7.7 kw-hrs. per day. Mr. Sween states that the results of brooding in this room were healthier chicks that developed faster than any he had raised previously.

THOUGH spirit without experience is dangerous, experience without spirit, is languid and defective. *Lord Chesterfield.*



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Electrical HOUSEKEEPING

Conducted by GAIL MEREDITH

And Sew On— THE ELECTRIC WAY

By POLLY VON SEHT
Scandia, Minnesota

"MOTHER, we've just got to start our spring sewing early, or we won't have anything to wear when spring comes. You know how long it takes every year to make even one dress on that balky old sewing machine. The belt slips, then the thread breaks, the bobbin runs out, and the stitching takes forever when you have to pump that treadle. Honestly, mother, anyone might think we were back in the candlelight era, using this machine," says twelve-year-old Susan Meyers.

Down the road about a half mile lives the Owens family. Kathie Owens, the twelve-year-old daughter, very jubilantly says to her mother, "Oh, mother, I'm going to do my own spring sewing this year. It's so much fun to sew on our electric sewing machine. And I just can't go wrong—the stitches are so perfect, and I can even sew at night because the light on the machine is just swell. And mother, I can even make you a dress, if you'd let me."

When Mrs. Owens purchased her new electric sewing machine, she had quite a task selecting the style she liked best. For there were charming table models, consoles, cabinets, and even desk models that opened into sewing machines. And she even considered buying the inexpensive little portable which weighs only 11 pounds and could be carried around easily in its case. A console was Mrs. Owens' choice finally, and it leads a double life. Sometimes it is an attractive piece of furniture in her living room, and then again it is her most-used electric equipment.

Says Kathryn: "Mother, I'm going to do my own sewing this year. It's fun on our electric machine"

When I asked Mrs. Owens to give me all the advantages that she derives from her electric sewing machine, she fairly bubbled over with enthusiasm. "Of course," she said, "it saves me time, it eliminates fatigue, and I think most important, it saves my nerves. Nothing used to 'get me down' more than sewing for my two daughters and myself. And I take pride in dressing my family nicely, so when the spring of the year came around, I was practically due for a nervous breakdown. But no more. Now, my Kathie loves to sew her own clothes, and she does a mighty fine job, too. Someday, I think she'll be a designer. Well, to get back to my sewing machine, I don't have any pumping to do, for with the slightest pressure on the knee control, I can start and stop. And it sews backwards and forwards. Just imagine, I don't need to remove the material or break the thread to restitch. All I do is simply reverse the machine." Mrs. Owens continued, showing me all the features which amazed even me. "See this flexible foot? Well, I think this was made especially for me. For I'm what you call a 'pinner' and not a baster, and this foot runs right over the pins as though they weren't there at all. It's wonderful! One thing that used to bother me an awful lot on my old machine was the bobbin running out of thread. See this bobbin. It's self-winding, and it's automatically supplied with thread while I'm sewing. And this light, Miss von Seht, is an eye-saver. It's placed just where it lights up your fabric best, and I can sit here and stitch many a seam at night, seeing better than most people do in the daytime."

Mrs. Owens pulled open a drawer and took out some unique looking devices. "These," she said proudly, "simply mean the difference between long hours of work done by hand, and doing it by machine. My mother endured hours of eye strain quilting my heirloom coverlets. Today I can quilt a coverlet in one-tenth of the time she spent, with this quilting attachment. When I start my sewing for my

daughters and self this spring, I'll use some lovely trimmings that used to take me hours to do by hand. Shirring, fagoting, braiding, and cording can be done with these devices. (Mrs. Owens handled these attachments as though they were made of platinum). This new zig-zag is most facinating. I use it when I sew lace onto lingerie for the girls. And if I want to applique a monogram on a luncheon set or embroider initials on a dress, this zig-zagger does the trick. Miss von Seht, now look at a gadget that has saved me many a dollar," she said proudly. "It's a hemstitcher, and I wouldn't part with it for love nor money. I hemstitch lunchcloths, pillow cases, curtains, dresses, and I can picot the edges of sashes, ruffles, and slips. All I do is hemstitch the edge of the fabric, then I cut directly in the center of the hemstitching, and the result is a picot edge. Another thing I used to dread in sewing was the overcasting of seams. But this pinking attachment has eliminated all that, for now I pink all seams. And anything else, too, like oilcloth, flannel and felt."

"Do you know, my dear," Mrs. Owens said confidentially, "this electric sewing machine is my most cherished possession. Because I know that if anything should ever happen to make me the breadwinner of this family, I could support my two daughters with it."

• • •

Just One More, Please

IF there is dust on your waffle iron, this is a good time to brush it off. There never was a month like February for parties, and that waffle iron can

help make your parties popular if you'll lift it down from the top shelf and put it to work.

It makes no difference what day you're celebrating; it doesn't matter whether this is a luncheon, a buffet supper, or an evening snack for the young fry after a sleigh ride, waffles and chicken cooked in cream, waffles and sizzling little brown sausages, waffles and scrambled eggs, and always to end up with, waffles and maple syrup, make it a party.

Serve with it fresh fruit in a compote or a salad, and choose a fruit that is a little tart—then plenty

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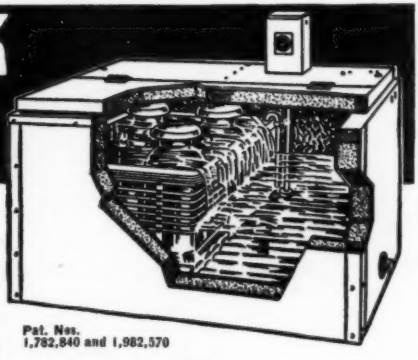

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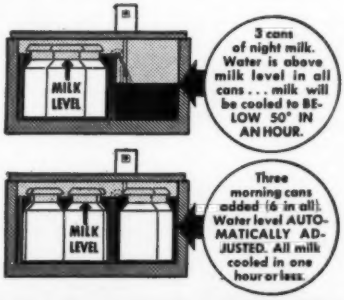
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of good, hot coffee. That is a meal that is easy to get and delicious to eat.

If you would like a new waffle recipe to supplement your own standby, consider this recipe for cheese waffles. It is made with cake flour and is grand for parties.

2 cups sifted cake flour
2 teaspoons baking powder
½ teaspoon salt
3 egg yolks well beaten
1 cup milk
4 tablespoons melted butter
3 egg whites stiffly beaten
1 cup grated cheese

Sift flour, measure, then sift with baking powder and salt. Mix together the egg yolks, milk and butter. Then add to the flour. Beat until smooth. Fold in cheese and egg whites. Bake according to the directions on your waffle iron.

I may suggest that if you should use the dry grated cheese you can buy in packages, you need only half a cup.

If you want to vary these, you can sprinkle the batter with diced, uncooked bacon before you let down the lid. And for some, if you would like a touch that will make the quietest guest gasp with pleasure, spread those hot cheese waffles with butter that is creamed with a dab of deviled ham, and sprinkled with a few, just a few drops of onion juice.

Should there be any water melon pickles in your fruit cellar, this is the time to bring them up. They're grand with these waffles.

• • •

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To top my list of blessings in these days of terror and suffering in Europe and Asia, I am thankful to be an American and to live in a country where I can work, talk, worship and vote as I desire, and live without fear of oppression.

I am thankful for my loved ones—my good husband and the thirty years of happiness we have had together, my dear daughter and her husband who are making a good home, and the rejuvenation and joy my grandbabies are bringing to us.

I am thankful for fairly good health and modern science which teaches me how to keep fit, for work and play that fills each day, for the pleasure of accomplishment in my small homely tasks, for the joy of anticipation, and that I can sleep soundly at night with a clear mind.

I am thankful for friends and neighbors, for the radio which has broadened my world and brought me entertainment and knowledge, and which is bringing the whole world closer together.

I am thankful that Christ came into the world with his teachings and hope. Also, for the many advantages and blessings of this modern day—for our fine educational systems, our work-saving devices made possible by electricity, our better means of communication with all the world.

I am thankful for my eyesight and that I can see and enjoy the many beauties of Nature—also that I have the capacity to get pleasure each day from the small beauties that surround me—the hill at my back door, the song of a bird, the sight of a bare tree against the horizon at sunset, the delicate, feathery snow on the roadside weeds, the glory of a sunset. And, too, for the wealth of reading matter available from which I can obtain enjoyment, relaxation, and the stimulus that keeps my mind alert.

And last, I am thankful that I can look back on my fifty years without too much regret; that although life has many times been hard, with much work, sickness and some sorrow, my husband and I have tried to be fair, honest and considerate in all our dealings and have accomplished a small measure of success, and attained a little of our dreams.

MRS. F. M. ALVORD,
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washing machine, you know, nowadays, just about what to look for.

First of all, you know that the tub must be the right size for your family. The salesman can tell you which machine to buy if you have six sheets in the wash every Monday, and which is best if you have twelve. You want to get the right size because overloading or underloading a machine decreases its efficiency. The size and shape of the washer itself will be important if you have limited space for storing it.

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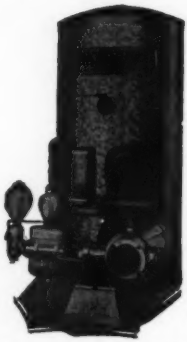

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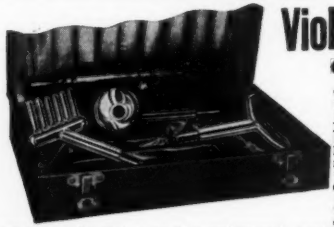

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February Contest

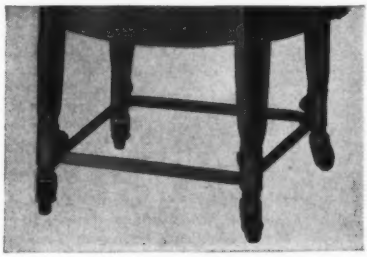
You know as well as I do that there are lots of cups of coffee setting on lots of breakfast tables in this country that might just as well be turned down the sink for all the pleasure they'll give their drinkers.

Some women just haven't bothered to learn how to make good coffee. Yet it is a simple thing to learn—or is it? What do you think? Please, all you people who know the trick of making good coffee every day, tell us how you manage.

For the letter we print on the subject, "I make a good cup of coffee this way," we will pay $5.00. If there are lots of good ones, and we use others later, we will send each writer a dollar for hers.

Your letters should be short, and should reach me by February 20, 1939. My address is Gail Meredith, 1026 Seminole Highway, Madison, Wisconsin.

speeds this up. The washer should have swivel casters, rust proof, easily oiled, and big enough so you can turn and wheel the washer about easily. Examine the working height of the tub. Some



The casters should be big enough so the machine will move easily.

machines have adjustable legs to fit the height of the tub to you.

See if the controls are placed so you will not have to stoop and reach to touch them. Make sure the tub is easy to clean, without crevices or grooves where dirt can catch. If the drain opening is protected by a strainer, that will prevent getting lint and buttons in the pump.

Listen to the machine run. It should not be noisy. In the first place noisy operation will annoy and bother you, and in the second, undue vibration limits the life of the washer.

See that the cord is long enough to reach the outlet you will have to use, and that it is made of heavy, waterproof material.

The wringer should have large rolls, automatically adjusted to take care of different loads, movable to different positions for the rinsing, and amply protected by an automatic safety release.

IT is folly to expect men to do all that they may reasonably be expected to do.

Richard Whatlet, Apothegms.

ON THE AIR

Conducted by
JEROME J. HENRY

A Wheelbarrow Radio

THE resoucefulness of a 13-year-old country boy who equipped his wheelbarrow with a battery radio set so that he could tune in programs on his way to and from school, was recently reported in a news broadcast.

Everett Hardy of Hooksett, New Hampshire, not only tunes in for his own entertainment, but he sets up the radio in the 2-room rural school so that his classmates may listen to music and educational programs as a part of their school work.

After school Everett takes down his set, reassembles it on his wheelbarrow and has radio programs all the way home. "You should have seen the boys follow him during the world series," the radio news reporter commented.

• • •

Tunes He Plays Become Hits

IF the man who said, "Give me the making of the songs of a nation and I care not who makes its laws," were alive today, he would salute young Horace Heidt, conductor of radio's Brigadiers.

Although Heidt has had no monopoly on the making of the Nation's songs he has played a vital part in putting those songs on the lips of

Horace Heidt, one of radio's popular orchestra leaders.

Americans from coast to coast. He has the distinction of playing for the first time on the air many of the songs which have become the great hits of the day.

Among the songs he has introduced are "Ti-Pi-Tin," "Dust," "I'll Still Be Loving You," "When They Played the Polka," "Ever So Quiet," "What

About Equipment?

Readers — We are glad to help you secure catalogs and descriptive literature on electrical appliances and equipment. It is a FREE service and NO OBLIGATION is involved.

When seeking information about any equipment you are planning to buy, first read the advertisements in this issue. They are your best guide. If you do not find what you want — use the handy coupon below, listing clearly and exactly the items on which you want further information.

For Home
___Better Sight Lamps
___Clocks
___Clothes Washers
___Coffee Makers
___Dishwashers
___Flat Irons
___Food Mixers
___Ironing Machines
___Lighting Fixtures
___Portable Heaters
___Radios
___Ranges
___Razors
___Refrigerators
___Roasters
___Sewing Machines
___Toasters
___Vacuum Cleaners
___Waffle Irons
___Water Heaters
___Water Softeners
___Water Supply

Gen'l Farm Equipment
___Auto Engine Heaters
___Corn Shellers
___Ensilage Cutters
___Feed Grinders
___Feed Mixers
___Hay Choppers
___Hay Hoists
___Insect Killers
___Motors
___Septic Tanks
___Ultraviolet Light
___Wood Saws
___Yard Lights

For Dairy Farm
___Animal Clippers
___Bottle Washers
___Churns
___Cream Separators
___Dairy Sterilizers
___Milk Coolers
___Milking Machines
___Ventilators

For Poultry Farm
___Brooders
___Burglar Alarms
___Drink. Fount. Warmers
___Egg Cleaners
___Egg Graders
___Incubators
___House Lighting

For Truck & Fruit Farm
___Fruit Graders
___Fruit Washers
___Irrigation Equipment
___Light for Plant Growth
___Soil Heating
___Soil Sterilizers
___Stationary Spray Plants
___Vegetable Washers

For Farm Shop
___Bench Saws
___Drills
___Paint Sprayers
___Soldering Irons
___Tool Grinders
___Welders
___Woodworkers

READER SERVICE COUPON — TEAR OFF HERE

ELECTRICITY ON THE FARM
Readers' Service Dept., 24 W. 40th St., New York

Without cost to me, please have manufacturers send complete information on the following Electrically Operated Equipment which I am thinking of buying:

....
....

My name is .....

Address .....

I get electricity from .....

.....

Check here ☐ if dealer. 2-39

Could be Sweeter Than Sweetheart," and others.

Though he has been called a musical "seer" for his ability to recognize hit songs when he first hears them, Heidt is guided by simple rules in choosing a tune. It must be simple enough to be sung easily by the average voice and there must be love interest, but not of unrequited love. In novelty numbers Heidt looks for unusual themes and a catchy rhythm, and he will often choose a novelty number that he thinks older people will enjoy.

That Heidt is ever on the alert for new tunes and ideas, even while paying social visits is evidenced by the story of the discovery of "Ti-Pi-Tin." Attending a luncheon at the home of a friend, he was intrigued by the song being played at the piano. He introduced himself to the pianist. Maria Grever, who was also the composer, and asked her to play it again. Impressed, he asked for the privilege of introducing the song on the air. The rest is history. The song sold more copies than any other during the past five years.

• • •

Progress in Sound Effects

WHEN you speak of the great progress made in radio, don't forget about the sound effects, the scenery of radio. To appreciate how far the techniques of sound effects have advanced, you have only to compare the methods used for creating sounds in the early days of radio with those being used today.

At network studios recordings are now used on phonographs to play "sounds" of more than 3,000 varieties, from the sizzle of a frying egg to the flight of a bombing plane. In the old days most of the sounds were hand made in such ways as these:

For airplanes—leather straps tied on electric fans, and playing the fans against a drum. Scraping a bass fiddle bow across the side of a peach basket made the sound of a screen door; whacking a stick across a carton or the padded seat of a chair made the sound of gun shots; and dropping the lid of a piano was always fairly good for imitating the sound of a slammed door.

Crunching berry boxes made the sound of crashes of various sorts; and if actors wanted to make their voices sound as if they were talking in a telephone they merely talked into a tumbler to distort the tones; a sieve full of dried peas, when tilted, sounded close enough to rain.

But nowadays things are different. Actual sounds are recorded and played to make the radio sounds really sound like the real thing. Whacking a stick across a padded chair is still good technique for a pistol shot, but for more elaborate sounds the recordings far surpass the crude efforts of the old days.

Sound effects are often discovered by accident. One time a sound effects man happened to pour salt on a crisp lettuce salad. The sound was so much like that of rain that salt poured over crisp lettuce was the standard sound effect for rain in the studios for some time. The rain machine in use today by one of the networks is some improvement on this. It is in fact one of the most complicated in the sound effects stock room. The secret of its success is the controlled sprinkling of bird seed upon a gauze impregnated with cellophane and stretched taut in a frame, and upon four other surfaces each of which produces a sound of slightly different frequency.

Clarence Jeffers Wins Sheep Shearing Contest

A NEW interest at the International Livestock Show this winter was a sheep shearing contest open to farm flock shearers from the United States and Canada. The event was won by Clarence Jeffers, 25-year-old farmer from

Up-to-date shearing equipment for farm flocks used in International shearing contest.

Princeton, Ill. His time was 3 minutes and 5 seconds or a shade under 10 minutes for his three sheep. Carl Hakes of Hanover, Mich., was second; Ed Zillig, San Prairie, Wis., third, and Peter Bobendrier, Elk River, Minn., fourth. Time, absence of second cuts in fleece, condition of the shorn sheep and fleece, and method of handling the sheep counted in the scoring.

Shearing was done with V-belt drive electric shearing machines.

That Chick

Fluffy daughter of an electric incubator. Yes, you are a daughter. You have been microscoped posteriorly under a strong electric light by an orientally educated eye. You will be treated well. Your electric hover will brood over you, for you are to be a layer. You were invigorated before you were conceived through ultra-violet irradiations of your progenitors by your foster parent,—man. You will be further irradiated as you grow, and lighted on your way as the cheerful, clucking possibilizer of the angel-food cake and the American breakfast. Your Chinked brothers also enjoy an electrified existence, even to an electric scalder and waxer, and glory-be, an electric freezer and frier. From dreamy economic anticipation to noodle soup, you are the Queen of the most electrified farm industry. Hail Chick!

1938 INDEX READY

A printed index of articles which have appeared in the 1938 isues of ELECTRICITY ON THE FARM has been prepared. It will be sent free on request. The index is the same dimensions as the magazine and suitable for brinding.

QUESTIONS and ANSWERS

Lights for Tractor

Question: *Is there any way a generator can be hooked directly to the lights for use on a tractor without using a battery? I have a generator. At what speed should it run?* L. B., Neb.

Answer: If you could run your generator at constant speed you might get along without a battery. We would not advise trying it. The tractor engine speed varies widely. When running fast it would tend to burn out the lights; when slow, you would have little light. Car generators are of different types. Better get the speed from the manufacturer (see name plate) or figure it from the car it was taken from. Or, regulate the speed so it will charge the battery at 10 to 14 amperes.

More Power at 1,000 or 2,000 R.P.M.

Question: *I have a question which has aroused much argument but still hasn't been settled definitely around this community.*

Will a motor rated at 2 H.P. and 2,000 R.P.M. develop more than 2 H.P. on a shaft that has been geared down to 1,000 R.P.M. R. B., Ia.

Answer: No. The amount of power generated will be the same. Since you introduce gearing in which there is some friction, the actual amount of power delivered by the low speed will be less than 2 H.P. because of this loss in friction.

Horsepower is the product of turning force and speed. When you cut the speed in half you double the turning force, but the product of the two remains the same.

Farm Hydro-Electric Plant

Question: *We run a boarding house and have a dam to make a swimming pool for our guests. Could water flowing over this dam be used to generate electricity? Where can I get information on a complete installation?* R. J. E., N. Y.

Answer: The Fitz Water Wheel Co., Hanover, Pa. make overshot wheels, turbine wheels and complete small hydro-electric plants. Generally speaking, it costs more to generate your own electricity than to buy it from a power company. The operating cost of a water-power plant is small, the major expense being in interest and depreciation on the plant. If your plant cost $1000, the interest and depreciation would amount to about $10 per month. Such plants are fine where conditions are right and central station service is not available.

Freezing Pipes—Thermostat Control

Question: *Have ¾ inch water pipe running up 40 ft. through five floors of poultry house. Please advise number of feet of soil heating cable to keep pipe from freezing and if thermostat can control temperature of water.* C. D. S., Pa.

Answer: Without a thermostat I recommend 80 ft. of soil heating cable which will use about

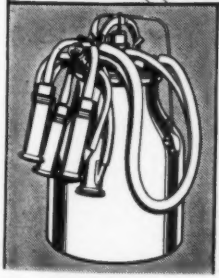
YOU'LL NEVER KNOW HOW MUCH BETTER, FASTER AND CLEANER A DE LAVAL MILKER WILL MILK YOUR COWS, UNTIL YOU TRY ONE

De Laval Dealers Now Making FREE TRIAL Demonstrations On Request

TO enable dairymen to determine exactly what a De Laval Milker will do for them this Company is now cooperating with De Laval Dealers throughout the country in a Free Trial Milker Demonstrating Program.

Many De Laval Dealers are equipped to put a milking machine in your barn for a free trial demonstration without obligating you in any way, so that you can determine to your own satisfaction exactly why the De Laval milks better, faster and cleaner; why it is simple to operate and easier to keep in a clean and sanitary condition.

No equipment a dairyman can own will give more profit and pleasure than a good milking machine. If you are interested in getting the best, see your De Laval Dealer; or if you do not know who he is, write to us for his name.



De Laval Portable Milker

THE DE LAVAL SEPARATOR COMPANY

New York 165 Broadway — Chicago 427 Randolph St. — San Francisco 61 Beale St.

INTERESTING CONTESTS

$3000.00

IN 100 CASH PRIZES

YOU DO NOT NEED TO BE A DE LAVAL USER TO ENTER CONTESTS. Any member of a farm family having one or more cows is invited to enter. See nearest De Laval Dealer for instructions and entry blanks for Contests. You are not required to buy anything and you may win a substantial cash prize. If you do not know the name of your nearest De Laval Dealer where entry blanks may be obtained, write nearest De Laval office for his name.

A GIFT FOR EVERYONE. In addition, every qualified entrant to the Contests will be sent a free copy of the famous pocket-size De Laval Diary and Farmer's Handbook of Useful Information as soon as entry is received at the De Laval office. It has 146 pages of condensed information, a large section for notes, and is one of the most useful and valuable books that can be obtained.

Plenty of Hot Water at Low Cost

you can have it with this

ELECTRIC AUTOMATIC WATER HEATER

DESIGNED expressely for dairy farms, its first cost is low and it is amazingly economical in operation. Simply pour in cold water and it is heated electrically and kept so automatically. Compact, absolutely safe, no odors, smoke or fumes. Tested and approved by leading agricultural colleges. See your electric company or write us for bulletin.

LOSEE PRODUCTS COMPANY, HEBRON, ILLINOIS
PIONEERS OF DAIRY STERILIZING EQUIPMENT

300 watts. Use 60 ft. with thermostat. Thermostats are made with bulbs extending into the water line through special pipe fittings. Your hotbed thermostat can be used, however, by wiring the bulb against the pipe and wrapping the bulb and pipe together with paper or other insulating material. The thermostat will regulate the maximum temperature. The water will not be heated much if drawn rapidly through wide open faucets.

Uses for 2 H.P. Motor

Question: *To what particular agricultural or farm use could a 2 H.P. 110-220 Volt, 22-11 Amp., 1750 R.P.M. motor be put?* C. H. B., W. Va.

Answer: A 2 H.P. 1750 R.P.M. motor might be used for grinding feed with small hammer or burr mills, for shelling corn, for mixing feed, for mixing concrete, for hoisting hay, to drive a small irrigation pump, for operating some milking machines or as a shop motor on a bench saw or turning lathe.

Ultra-Violet Lamps for Pigs

Question: *Could you give me some information in regard to using ultra-violet ray lamps for sows with pigs in the winter. How much does an ultra-violet lamp cost for such use?* P. A. H., Ind.

Answer: We would recommend using 250-watt CX Mazda lamps in aluminum reflectors placed from 24 to 30 inches above your pigs. Turn this light on just before farrowing. The sow will enjoy the warmth which will also help to dry off the pigs when they are born. It would be a good plan to place the lamps near a corner and put a guard rail across the corner.

250-watt CX lamps cost $1.25, 500-watt CX lamps cost $2.25. Be sure the voltage in your barn is as high as that stamped on the lamp. If the voltage is low, the ultra-violet output drops off rapidly.

Electric Milk Pasteurizer

Question: *Will you please give me what information you can about pasteurizing milk with electricity? Where can equipment be purchased?* D. B., Ind.

Answer: The only electric pasteurizer on the market is made by the Trumbull Elec. Mfg. Co., Plainville, Conn. It is only economical at present where one pasteurizes 1,000 quarts or more per day. The University of Maryland is experimenting on a small batch pasteurizer. Milk is pasteurized electrically by passing a current through it between carbon electrodes. It is the heat generated, and not the current, which does the pasteurizing. It is also possible to use electric steam boilers or electric steam accumulators (see E.O.F., June, 1938, p. 13) with standard steam pasteurizing equipment; or you may use large electric water heaters with standard spray type pasteurizers. Ultra-violet irradiation has been tried but no practical equipment has been devised for giving adequate penetration of the milk.

CHURN WITHOUT TURNING A HAND!

GET MORE BUTTER *FASTER EASIER* WITH DAZEY ELECTRIC

● All the features that have made DAZEY hand churn famous for generations made still more efficient by POWER. Unbelievable savings of time and labor. Priced remarkably low. Sold wherever there are rural power lines. Write us for particulars.

DAZEY CHURN & MFG. CO., Dept. A-181, St. Louis, Mo

DAZEY ELECTRIC CHURNS

HOW TO BANISH **CARE & WORRY** FROM YOUR BROODER HOUSE

● Get a CYCLONE Brooder. You can depend completely on its automatic operation. It's safe and unfailing. It makes room for the chicks as they grow!

Cyclone EXPANSION HOVER **ELECTRIC BROODERS**

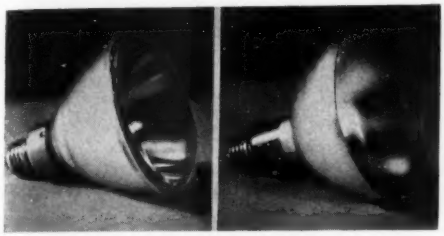
THE CYCLONE MFG. CO. DEPT. 72
HEBRON, INDIANA

Reviewed by T. E. HIENTON

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request to What's New Department, ELECTRICITY ON THE FARM, *24 West 40th Street, New York, N. Y.*

Floodlight and Reflector Lamps

Two new lamps have recently been placed on the market. In each, a silvered reflecting surface is placed directly on the glass of the lamps. These reflecting surfaces remain clean and have higher reflecting efficiency than external reflectors. The



Flood Lamp Reflector Lamp

projector flood lamp is of 150 watt size and sells for $1.70. It has a beam spread of 50°, with a maximum candlepower on the axis of about 3800. A similar lamp with 25° spread for spotlight purposes will be available soon. These lamps may be used out of doors and are suitable for protective and flood lighting purposes. The reflector lamp is made of thin glass suitable for inside use. It is 150 watts, has a 30° beam of approximately 5700 candlepower maximum and sells for $1.10.

Low Cost Brooders

One of the successful Mid-West brooder manufacturers has added three low cost brooders to his line. One is a 50 chick, lamp heated midget to sell at $1.95. The other two are 36 and 52 inches

"PLOWS CLEAN THROUGH 3 DAYS' GROWTH"

MADE FOR TOUGH BEARDS

It takes off he-man whiskers. . . . whisks 'em off fast. It's the only shaver built on the proven 50-year-old clipping principle. Strong men quake at the thought of daily scraping with a razor. Tough guys can't use ordinary electric shavers. That's why the Nu-Era WHISKer makes such a hit among the boys with bushy beards.

MONEY-BACK GUARANTEE

Try the WHISKer. It must delight you or it's no deal. If you can't get a WHISKer at your dealer's, order direct from factory, $12.50 postpaid. Or, if you wish, send only $1—pay postman balance plus postage.

(1) No gears, no bearings . . . one moving part.
(2) No brushes to arc . . . no radio interference.
(3) Quiet . . . purrs like a kitten.
(4) Fast . . . 14,000 cutting strokes per minute.

Electro Tool Corp., Dept. 129-B, Racine, Wis.

NU-ERA Whisker
THE SHAVER THAT SHAVES Any BEARD

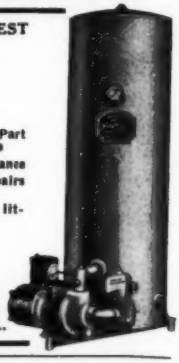
THOSE WHO WANT THE BEST ALWAYS SELECT THE
BURKS
SUPER NIAGARETTE TURBINE
WATER SYSTEM

Lifts Water 28 Feet—Only One Moving Part
Simple in Design Compact in Size

NO Gears, Pulleys, Liners, Pistons, Belts, Cranks, Chains, Leathers, Valves
To interrupt performance
To make costly repairs necessary
To crush inquisitive little fingers

EXCLUSIVE FEATURES
• Quiet
• Self Priming
• Automatic
• Largest hourly pumping cap.
• Tanks galvanized

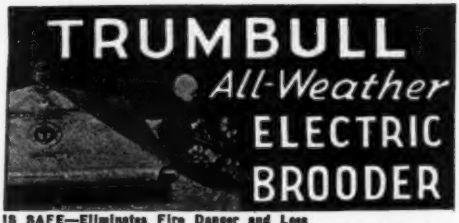
DECATUR PUMP CO., DECATUR, ILL.



Get Your GRINDER
DIRECT FROM FACTORY
or Through Your Local Power Company or Distributor . . .

THE BELL Hammer-Mill Grinder does the work of Mills 2 to 4 times its size and horse-power. Cheap to buy and to use. Grinds all kinds of grain and roughages for stock and poultry for as little as 6 cents a ton. It also elevates at the rate of 50 bu. per hour up to 50 ft. high, using 1½ H.P. motor. Made in 2 sizes, 1 to 5 H.P. ELECTRIC OR ENGINE POWER. Guaranteed by 80 year old company—over a million BELL Grinding Mills in use all over the world. Send for BIG, FREE BOOK ON STOCK FEED GRINDING, today. Write,
C. S. BELL CO., MFRS.
Dept. 41, Hillsboro, Ohio

TRUMBULL
All-Weather
ELECTRIC
BROODER

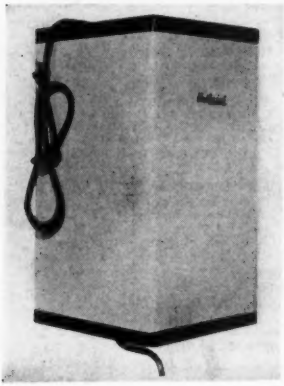


IS SAFE—Eliminates Fire Danger and Loss
SAVES TIME AND WORK—Eliminates Many Chores, Requires Less Attention
MAKES MONEY—Better Grown—Stronger—Heavier Birds
CAN BE USED ANY TIME—ANYWHERE
Write today for Free Bulletin 10008
The Trumbull Electric Mfg. Co. 1012 Woodford Ave. Plainville, Conn.

square. with 500 watt and 800 watt ring heaters for 200 and 400 chicks, and listed at $12.95 and $15.95 respectively. The chief difference between these and the regular line is in insulation.

Low Cost, 2-Gallon Water Heaters

Two manufacturers are offering small electric water heaters which have been received enthusiastically where they have been installed on trial.



The heaters are mounted over the sink. Connection to the cold water line is made by a flexible tube (no special plumbing or wiring required). The electric element is plugged into any 115 volt wall outlet. When cold water is turned into the tank, hot water is forced out. The tank is always full but is not under pressure. Heating elements are 1,150 and 1,500 watts. Tanks are insulated and the water temperature controlled by reliable thermostats which may be adjusted for different temperatures. The two gallons of water in the tank will heat up reasonably quickly, and the operating cost is low because there is a small area of tank to radiate heat, and no long runs of pipe to heat up. These heaters are not intended for bath or laundry or where large quantities of hot water are needed, but are good over kitchen sinks and in wash rooms.

Poultry Scalder and Waxer

The new method of picking fowls is to "scald" at a temperature (128 degrees to 130 degrees) which is hot enough to loosen the feathers and not hot enough to cook or injure the texture of the skin. Pin feathers are then removed by immersing the bird in molten wax, plunging in cold water and then cracking off the wax which takes pin feathers with it. The secret of the process is in maintaining water and wax at correct temperatures. This is done by electric equipment which is now

on the market. Wax is remelted and used again after skimming out the feathers.

Small, Cabinet-Type Incubators

The illustration shows three cabinet type incubators of 96, 240 and 480 (hen) eggs capacities. Each has fan circulation of the air and automatic temperature control which may be regulated from outside the cabinet. In the two larger units the eggs are turned by simply reversing the trays. The smaller unit may be used as a separate hatcher. Wattages of the three units are 95, 190 and 245 respectively and power consumption ¼ kwh or less per egg, per hatch. Incubator may be plugged into any 115 volt alternating current outlet. Prices $29 to $53.

MAKOMB ELECT-O-STAT
A GREAT ELECTRIC SINCE 1929
USES LESS CURRENT

Scientifically correct, with electric fan three-way air diffusion that cuts current cost 30 to 40%. Edge to edge silvered insulation. Head room for big founts. Bright gleaming 36-inch concave reflectors. Dual elements for safety. Steep, rigid canopy stays clean. 19-inch vent tube cuts heat loss. No room too cold. Write for folder on these sensational brooders.

THE MAKOMB LINE 103 MADISON AVENUE MACOMB, ILLINOIS
World's Largest Manufacturer of Brooders

CLASSIFIED ADVERTISING

ELECTRIFY WITH MONEY saving Lyon Equipment. BROODERS, many types and prices, prompt delivery from stocks maintained at key points. Write for free *all-electric* catalog describing modern incubators, burglar and fire alarms, water heaters, time switches, plans and supplies for home-made equipment, etc., LYON ELECTRIC CO., Dept. EF, San Diego, Calif.

FREE—BROWER'S New big 100-page Poultry Supply Catalog and Guide. Shows largest line of poultry equipment in world—all at new low prices. Over 425 items, including electric waterers, brooders, incubators, feed mixers, broiler batteries. Write today. Brower Mfg. Company, Dept. N-39, Quincy, Ill.

WRITE FOR FREE COPY of Bussey's Book for Poultrymen. Low prices on parts for electric brooders and batteries. Complete heating assembly—factory price only $2.75. BUSSEY PEN PRODUCTS COMPANY, 5151 West 65th Street, Chicago, Illinois.